Physics 311

Homework Set 7

1. A metal sphere of radius R, carrying charge $+Q$, is surrounded by a thick concentric metal shell (inner radius A, outer radius B). The shell carries no net charge.
   a) Find the surface charge density σ at R, at A, and at B.
   b) Find the potential at the center, using infinity as the reference point.
   c) Now the outer surface is touched to a grounding wire, which lowers its potential to zero (same as at infinity). How do your answers to (a) and (b) change?

2. Find the capacitance per unit length of two coaxial metal cylindrical tubes of inner radius A and outer radius B.